up to the 60 per cent. of the prime fat steer, but at an average of 56 per cent. was still high enough to secure a place in the first grade of quality. What these figures mean in terms of beef output is demonstrated by Prof. Wood by a comparison with the results of pre-war experiments, from which it would appear that the decrease in oilcake consumption from 8 lb. to 1½ lb. per head per day only reduces the liveweight increase by 3·3 per cent., and the meat output by 9 per cent. The results show further that from the point of view of profit the high cake ration would assuredly be a mistake at the present time, since for each extra pound of beef produced 13 lb. of cake costing about 2*s*. would be consumed.

Even more far-reaching conclusions as to the desirability of aiming at a lower stage of fatness in beef production under present conditions are arrived at by Mr. K. J. J. Mackenzie and Dr. F. H. A. Marshall from investigations of which a summary is given in the September issue of the same journal. These conclusions are based upon data obtained with ninety-two beasts of different degrees of "ripeness" specially selected for the purpose, weighed and slaughtered under conditions permitting of exact observation. The observations were extended further to the edibility of selected portions of the carcass and the proportion of waste involved in their consumption. From the data obtained the conclusions are drawn that the ordinary method of judging the condition of a beast by "handling" may often lead to serious errors of judgment as to its fitness for the butcher, generally resulting in far too many beasts being kept beyond the most economic time for killing; that beyond a certain point further increase in weight does not contribute effectively to the meat supply, being mainly waste fat; and that no serious complaint on the ground of quality can be brought against the meat from the half-fat beast, the consumption of which is attended with the minimal quantity of waste.

On certain points of detail the practical man will doubtless find these observations not entirely convincing, but the general support they afford to the policy of retrenchment in cattle-feeding can scarcely be questioned. C. C.

STATE ASSISTANCE TO THE DYE INDUSTRY.

A MEMORANDUM (Cd. 9194, price 2*d.*) has just been issued by the Board of Trade giving details of the scheme for the allocation and administration of the funds provided by Parliament for assistance in the development of the dye industry. It is pointed out that the primary object of the financial assistance to be given is to make the British textile users of dyes independent of German dyestuffs, and to enable the manufacturers to bring down the cost of production to a point at which competition with the large-scale industry of Germany will be commercially possible. Loans and grants of money are to be given to assist in the provision of buildings and plant, and for the maintenance of a system of research. These funds are additional to and independent of the moneys already advanced to the firm known as British Dyes, Ltd. There are dyes which at the present time are not being manufactured in this country at all, or are being made in quantities insufficient for the reasonable needs of dye users, and in this direction especially encouragement is needed.

As to the work of research distinct from the technical routine of manufacturing operations, it is now recognised as an inherent part of the industry, and that it properly enters into the cost of production, since experience shows that in normal times a constant flow of new colours or varieties of colours is necessary for the maintenance of those dye-using trades which are subject to outside competition. It is also acknowledged that, while continued research must be carried on, it does not follow that commercial advantages may be immediately secured. The administration of the scheme will be carried out by (1) a loan and grant committee, (2) a trade and licensing committee, (3) an inspector of research, and (4) an inspector of accounts.

The business of the trade and licensing committee will be to determine what colours and intermediate products shall be licensed to be imported into the country after the war, and in what quantities, and to advise the Commissioner as to the colours and intermediates the manufacture of which should be specially encouraged, and the order of their importance. The committee will consist of four representatives of colour users and four representatives of dye manufacturers under an independent chairman appointed by the Board of Trade.

The inspector of research will occupy an important and somewhat difficult position. It is obvious that he must be a highly qualified "organic" chemist with special knowledge of the production of intermediates, as well as dyes. By his reports to the Dye Commissioner he will practically control the work that goes on in all the research laboratories connected with the works, and as the connection between the experiments actually in progress and the ultimate bearing of the results on industrial operations is often not very obvious, a good deal of patience and discretion will need to be exercised.

Conditions relative to the rate of interest to be charged on loans and the amount to be set aside for depreciation and obsolescence of plant and buildings, as well as for the repayment of the loans, are set forth in the memorandum.

COMMERCIAL AVIATION.

THE subject of commercial aviation is one that has attracted a great deal of attention during the latter phases of the war, and now that hostilities are at an end it has become a matter of the first importance. A vast organisation has been created in order to provide the necessary machines and men for the needs of the Royal Air Force, and it seems almost certain that the full military output of which we are now capable will

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not be required in times of peace. If, however, aviation is to take a prominent place in the commerce of the future, an outlet will be at once found for the energies of designers and manufacturers of aircraft.

There are many indications that the aeroplane will soon become an important factor in international trade, though it is at present impossible to forecast the extent of such developments. The *Times* of November 15 reports that Mr. Holt Thomas intends to institute a passenger service between London and Paris as soon as circumstances permit. Machines that had been designed for bombing work over German territory are to be used, and it is hoped to make the complete journey in three hours and a half, the actual flying time from aerodrome to aerodrome being two and a half hours. The price of the tickets will be fifteen guineas per passenger, and the service will be a daily one, weather permitting.

Close on this announcement comes the news that a record flight has been made over London by a Handley-Page machine carrying forty passengers, together with fuel for a six hours' flight. This remarkable achievement, in which the previous record number of passengers has been doubled, should do much to convince the sceptic of the possibility of an effective aeroplane passenger service. It appears likely, however, that one of the greatest commercial uses of the aeroplane will be the carrying of international mails, where the increased speed of transit would be a great asset to commercial activities.

The *Times* of November 16, which reports the above record passenger flight, also gives an account of a speech by Lord Weir, made at the opening of the exhibition of enemy aircraft at the Agricultural Hall. Lord Weir, in referring to commercial aviation, expressed his opinion that while the possibilities are great, the probabilities are not so great. A period of pioneer work must be expected, and he hoped that the State would be able to render much assistance to those manufacturers whose thoughts were turned to the new problems involved. It is earnestly to be hoped that such will be the case, and there seems little doubt that if our unique facilities for aeronautical experiment and research can be applied to the new problems of commercial aviation, the pioneer period will not be a very long one, and results of great importance will soon be reached. The development of aerial intercourse between the nations should do much to keep them in closer touch one with another, and thus aid in the world's progress towards the desired goal of universal peace.

NOTES.

The following is a list of those to whom the Royal Society has this year awarded medals. The awards of the Royal medals have received the King's approval:—The Copley medal to Prof. H. A. Lorentz, For.Mem.R.S., for his distinguished researches in mathematical physics. The Rumford medal to Prof. Charles Fabry and Dr. Alfred Perot (jointly) for their contributions to optics. A Royal medal to Prof. Alfred Fowler, F.R.S., for his distinguished researches on physical astronomy and spectroscopy. A Royal medal to Prof. F. G. Hopkins, F.R.S., for his researches in chemical physiology. The Davy medal to Prof. F. S. Kipping, F.R.S., for his studies in the camphor group and among the organic derivatives of nitrogen and silicon. The Darwin medal to Dr. H. F. Osborn for his valuable researches on vertebrate morphology and palæontology. The Hughes medal to Mr. Irving Langmuir for his researches in molecular physics.

Weather information is now again allowed to appear in the columns of the newspaper Press, and the Meteorological Office has, from last Monday, resumed the issue of its official forecasts. It must necessarily be some time before the circulation of the various weather reports is in pre-war order. By the action of the Government the issue of much of the ordinary weather information was suspended at the end of September, 1914, and from May 1, 1915, the Meteorological Office ceased to issue weather forecasts; for some time afterwards, so far as current weather is concerned, only the observations of sunshine, rainfall, and temperature from the health resorts were issued, and these, after a short period, were also stopped. The action was taken in order that no useful hint should be given to aid Germany's air-raids. During the last few months of the war the censorship of the weather was so severe that no mention of the weather was allowed in the newspaper Press. The Weather Office has contributed information of the highest value to the Air Service, Navy, and Army throughout the period of the war. There is an opportunity now for much greater usefulness than prior to the war, and information will doubtless be eagerly sought for by the aerial services. If a journey to India is undertaken by aircraft it would probably be fairly ideal in the summer, the surface winds being favourable, and by passing over the Arabian Sea use can be made of the area of low barometric pressure situated over the northern portion of India. In the winter, however, the strong southerly surface winds blowing round the high-pressure area over Asia would be embarrassing, and probably the upper-air current would prove more favourable. Meteorological problems will have to be grasped by the flying experts, and knowledge gained relative to the upper air must be made public, just as in the past the seaman has acquired knowledge of air and sea currents at the sea surface.

We sympathise with Lord Sudeley's protest, in a letter to the *Times* of November 15, against "such a long delay as six months being permitted to elapse before our museums are once more at full swing." The sooner they resume their full activities of acquisition, investigation, and instruction, the better. It is with elementary and popular education that Lord Sudeley is chiefly concerned, and he rightly directs attention once again to the presence of our soldiers from the Dominions and we would add those from the United States, so many of whom wish to see these great institutions. Yet if Lord Sudeley thinks that a return to peace conditions can be "a matter only of weeks," he is over-sanguine. It is easier to pull down than to build up, and, even with a full staff, the replacement of the numerous objects that have been removed—some to considerable distances—with their proper ordering and labelling, would take months rather than weeks. But the staffs are not complete; many men will never return; many cannot yet be spared from their military and other national duties. Their work cannot be done by new and untrained men, still less by stopgaps. None the less, the task of

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